Enwex rulebook - version 2026

30.12.2025
with additional regions from 15.06.2026
with updated versioning routine after market consultation, 09.10.2026
with documentation correction in appendix 2 (Finland, Norway, Sweden, Portugal) and Appendix 3 (regional Austrian coordinates), 17.11.2026

for European indices

Enwex Energy Weather Indices are created to meet the optimized balance between (i) accuracy of represented weather development data and (ii) simplicity for a sufficient understanding by traders and markets.
Enwex is a registered trademark (EUIPO reg. No. 018892447). ENWEX has established its index methodology and governance framework with reference to the IOSCO Principles for Financial Benchmarks, applying a proportionate approach reflecting the nature and use of its indices. ENWEX monitors the applicability of the EU Benchmark Regulation (BMR) to its activities.

The indices are published in immutable versions pursuant to the following methodology:

1.) Index basics

- Generally, any Enwex Index is representing a certain predefined territory (market region or countrywide).

- A predefined territory, if possible, the largest political unit, e.g. provinces or federal states, with their fraction of supply (wind, solar) or demand (via population for temperature products) determine the weighting of the representative grid point.

- These grid points per territory are determined as the nearest one to the middle of a province. For each parameter the same grid point per province is used.

- The spatial resolution of the grid is 0,25° Lat Lon, the temporal resolution is hourly with timestamps representing the hour begin.

- This temporal resolution will persist in case of markets allowing a higher temporal resolution of prices, as weather models and their data resolution are decisive for Enwex. So for derivatives on Enwex, e.g. market values / PPA / capture rates, the power prices will be averaged for the forecasted hour and then multiplied by the utilization figure of Enwex.

- Weather parameters currently translated into Enwex Indices:
  a) Temperature: by population weight per province.
  b) Wind: by installed capacity per province along transparent datasets as listed in **Appendix 1**. For some countries, wind indices are available for onshore capacities and offshore separately and in total.
  c) Solar: by installed capacity per province along sources in **Appendix1**.

- Day ahead settlement data of European Enwex Indices are generally published at 10:00 AM local time (Berlin) at www.enwex.com and via API, also for the UK (= 09:00 AM local time London).

2.) Index update routine (every two years)

- ENWEX updates its wind and solar index methodologies every two years to reflect changes in installed generation capacities, their geographical distribution and relevant technological developments. New index versions are identified by their effective year (e.g. v26, v28, v30).

- Total and regional installed capacities are based on end of previous calendar year. If there is no update on regional installed capacities as of 31st of December of previous year, the weighting for the affected country will be done along the latest available publication.

- Each new version is published on 1 July of the preceding calendar year and becomes effective on 1 January of its version year at 00:00 local time in the respective index territory. For example, v28 will be published on 1 July 2027 and become effective on 1 January 2028.

- The six-month period between publication and the effective date allows market participants to compare the existing and upcoming index versions, including their historical and forward curves.

- Methodology updates may include:
  a) Changes to regional capacity weightings.
  b) Changes to technological parameters used in the wind and solar utilisation formulas.
  c) Changes to the relative onshore and offshore capacity weights of combined wind indices.

- Each version retains its methodology, parameters and weightings throughout its publication period. ENWEX will announce the affected indices, relevant

parameter and weighting changes, publication date and effective date when releasing a new version.

- The biennial update routine applies to wind and solar indices. Temperature index weightings continue to be reviewed every five years, with the next scheduled update in 2030. For consistency of curve naming, temperature series may nevertheless carry the latest general ENWEX version identifier (e.g. currently v26).

- Fixed-version curves: Each index version has its own curve IDs. The methodology, parameters and capacity weightings of a fixed-version curve remain unchanged throughout its publication period.
  For backtesting purposes, each version has an updated backward calculation available for (a) from 1980 to present for reanalysis data and (b) from 2013 to present for EC oper day ahead data. There also is a set of combined curves (c) with begin from 1980 to 2012 including reanalysis data and from 1.1.2013 switching to EC oper day ahead data.
  ⇨ Within backtest files, the underlying weighting per timeseries stays unchanged through the years of the entire dataset, new versions receive new curve ID's.

- Rolling settlement curves: Each index and territory combination has a permanent rolling settlement curve ID. On 1 January of each new version year, at 00:00 local time, the rolling settlement curve switches to the newly effective index version. All observations belonging to 31 December local time are calculated using the previous version. All observations belonging to 1 January local time are calculated using the new version.
  No scheduled methodology version changes take effect during a calendar month.
  ⇨ For settlement data, curve ID's stay unchanged through the years, but underlying weighting is updating.

- Previous index versions will continue to be published for as long as they are referenced by outstanding contracts, subject to a maximum continuation period of ten years following the end of their effective version year, in accordance with the ENWEX cessation policy.

- Province means and their actual weightings are calculated as regional MW installed divided by total MW installed in the territory. Current values for weighting within a territory are listed in **Appendix 3.**

3.) Weather model specifications

- The weather model applied is the operational model of European center for medium range forecast (ECMWF; https://www.ecmwf.int/en/about/what-we-do; https://www.ecmwf.int/en/publications/ifs-documentation) in its 0.25 degree spatial resolution and the 00 UTC update.
- Model parameters used from ECMWF oper are:
    a) Temperature: 2m temperature
    b) Wind: windspeed in m/s out of 100m level of u-wind and v-wind
    c) Solar: Incoming shortwave radiation at surface

- Timesteps: Hourly resolution for the forecast period day ahead in local time (e.g. for Germany in wintertime H+23 to H+47).

- Fallback routine:
  In case of ECMWF model delay, fallback solution for index calculation is with identical method and parameters but using ECMWF operational with basis 12 hours before (12 UTC). This means for e.g. Germany (wintertime) then timesteps H+35 to H+59.

- Reanalysis data in API timeseries from 1979 onwards are calculated out of ERA5 models, https://cds.climate.copernicus.eu/datasets/reanalysis-era5-single-levels?tab=overview , using the same weather parameters, spatial and temporal resolution as from EC oper.

- Historical data by EC oper and ERA5 for Enwex in the current and previous year's versions can be downloaded via Enwex API. For access and further information mailto info@enwex.com

- Handling of weather model generation switch:

    a) EC oper: Direct implementation of new model versions after official release by ECMWF with unchanged spatial (0.25°) and temporal (hourly) resolution. Historical Data in API stays unchanged and is always reflecting the latest state of EC oper model at day ahead settlement.
    b) ERA5: With planned new model generation (ERA6), all historical timeseries will be published with the next version in ERA6 and ERA5 for comparability reasons. After at least twelve months of ERA6 availability, the indices will just be available in the new ERA version.

4.) Index calculation per parameter

Weather parameters used and the formula per territory for calculation of wind and solar utilization are part of the biennial update routine. To handle potential biases driven e.g. by technological improvements on the efficiency factor or the other way round, by aging effects, there is a technology coefficient.

For biases exceeding 0,5% in backtesting of the previous period from January$_{(year-1)}$ until December$_{(year)}$ in observation data (usually ENTSO-E, for Germany Netztransparenz), coefficient c will be modified by full % figure, e.g. +1,6% bias will lead to a technology coefficient of 1,02. Any changes to these parameters become effective exclusively on 1 January of the relevant new version year.

The next review of the complete formula for each parameter and its coefficients is scheduled for the Enwex version v30, valid in 2030.

a) Temperature:

Enwex temperature = 2m temperature in ° Celsius

b) Solar:

Enwex solar = Utilization of installed solar capacity $= c * ((f * S * A) / (S_0 * A)) = c * (f * S / S_0)$

with:
c = technology coefficient = 1,00 (for neutralizing possible general biases)
f = factor depending on mean module efficiency and module orientation, varying per country (e.g., Germany 0,71)
S [W/m²] = shortwave radiation at surface = ECMWF operational model output for incoming radiation at surface
A [m²] = Area of installed solar modules
S_0 [W/m²] = Order of magnitude of the maximum possible solar radiation at the surface = 10^3 W/m² = 1000 W/m²

c) Wind:

Enwex wind = Utilization of installed capacity $= c * ((U_0 + u_a) / (1,0 + \exp(v_s - s * (w - xs) - r)) - u_a)$

with:
c = technology coefficient = 1,00 (for neutralizing possible general biases)
U_0 = Maximum utilization: Max average power output per installed capacity, usually below 1,00 due to e.g., outages, revisions
u_a = Util addition: modifies slope, subtracted at end of formula to avoid influence on maximum
v_s [m/s] = Start wind speed: average turbine start speed
s = Slope: Steepness of exponential function
w [m/s] = Windspeed: Calculated from the ECMWF operational model output for u- and v-wind components in 100m height
xs = X-axis shift: Shift to avoid negative values with low wind

r = average roughness length of landscape

Notes:
Windspeed values smaller than start wind speed of turbines in this formula providing negative results, therefore need to be replaced by 0. Calculated values exceeding 100% utilisation are capped at 100%, including after application of the technology coefficient.

The settlement value of each ENWEX Index shall be published rounded to two decimal places using commercial rounding (round half away from zero).

Coefficients for renewables per country can be found in **Appendix 2**.

A general note on curtailments:

Enwex does not adjust for curtailments, since the indices are designed to represent weather-driven potential supply rather than actual realized feed-in. This methodological choice may result in a temporary positive utilization bias compared with reported figures for solar and wind production, such as those published by ENTSO-E.

5.) Regulatory Governance Framework

Governance, Oversight and Methodology Control

ENWEX applies a proportionate governance structure, taking into account the nature, scale and use of its indices and drawing on relevant principles of benchmark governance.

- Benchmark Administrator: responsible for methodology approval and biennial updates.
- Data Steward: validates input data and monitors data quality.
- IT Lead: oversees operational stability and fallback processes.
- Compliance Function: monitors relevant benchmark governance principles assesses applicable regulatory requirements, including the EU Benchmark Regulation (BMR).
- Oversight is implemented via structured annual self-assessments, with optional external review.

No discretionary judgement is applied outside predefined rules.

Complaints and Consultation Procedures

Users may submit methodology or benchmark-related complaints to info@enwex.com
All complaints are logged, evaluated and resolved according to the Enwex Complaints Procedure.

Material methodology changes follow a consultation process unless operational urgency requires immediate action. Criteria for materiality include parameter changes with >5% expected impact, sourcing changes, or fleet-model revisions.

Cessation and Transition Policy Overview

Enwex maintains benchmark versions for up to ten years or until no open contracts reference them.
Users will be notified at least six months prior to cessation. Transition guidance and alternative benchmark series are provided in the Benchmark Statement.

Appendix 1: Data sources on installed capacities

Austria:

- Wind: http://www.thewindpower.net (global dataset, update from 17.8.25)
- Solar: https://pvaustria.at/bundeslaender/ (data including 2024)

Belgium:

- Wind: http://www.thewindpower.net (global dataset, update from 17.8.25)
- Solar: https://www.elia.be/en/grid-data/generation-data/solar-pv-power-generation-data (grid operator; data as visualized on 01.09.2025)

Denmark:

- Wind: http://www.thewindpower.net (global dataset, update from 17.8.25)
- Solar: https://ens.dk/en/energy-sources (grid operator; data as visualized on 01.09.2025)

Finland:

- Wind: http://www.thewindpower.net (global dataset, update from 17.2.26)

France:

- Wind: http://www.thewindpower.net (global dataset, update from 17.8.25)
- Solar: https://odre.opendatasoft.com/explore/dataset/parc-regional-annuel-prod-eolien-solaire (Open Data Réseaux Energies, data including 2024)

Germany:

- https://www.bundesnetzagentur.de/DE/Fachthemen/ElektrizitaetundGas/ErneuerbareEnergien/EE-Statistik/start.html (wind & solar, update from 18.8.25)

Italy:

- Wind: http://www.thewindpower.net (global dataset, update from 17.8.25)
- Solar: https://www.statista.com/statistics/888529/installed-capacity-of-solar-power-plants-by-region-in-italy/ (Statista, installed 2023, no regional 2024 data available yet)

Netherlands:

- Wind: http://www.thewindpower.net (global dataset, update from 17.8.25)
- Solar: https://opendata.cbs.nl/statline#/CBS/nl/dataset/85005NED/table?ts=1668421767653 (Centraal Bureau voor de Statistiek, installed capacities by end 2024)

Norway:

- Wind: http://www.thewindpower.net (global dataset, update from 17.2.26)

Poland:

- Wind: http://www.thewindpower.net (global dataset, update from 17.8.25)
- Solar: https://ieo.pl/aktualnosci/1677-ponad-40-procentowy-przyrost-nowych-mocy-zainstalowanych-w-fotowoltaice%20;%20Kapazität%20großer%20Anlagen

Portugal:

- Wind: http://www.thewindpower.net (global dataset, update from 17.2.26)
- Solar: https://www.dgeg.gov.pt/en/statistics/energy-statistics/publications/flash-statistics-for-renewables/ (based on 2025, taken from update March 2026)

Spain:

- Wind: http://www.thewindpower.net (global dataset, update from 17.8.25)
- Solar: https://www.sistemaelectrico-ree.es/en/renewable-energies-report/sun/installed-capacity/photovoltaic-solar-sunpower (Red electrica, based on January 2024)

Sweden:

- Wind: http://www.thewindpower.net (global dataset, update from 17.2.26)
- Solar: https://pxexternal.energimyndigheten.se/pxweb/en/Energimyndighetens_statistikdatabas/Energimyndighetens_statistikdatabas__Officiell_energistatistik__Natanslutna_solcellsanlaggningar/EN0123_1.px/ (Swedish Energy Agency, based on 2025, updated 7.4.26)

United Kingdom:

- Wind: http://www.thewindpower.net (global dataset, update from 17.8.25)
- Solar: https://www.gov.uk/government/statistics/regional-renewable-statistics (Installed by end 2023, update on end 2024 not available yet)

Appendix 2: v26 coefficients for renewable utilization

Solar

Austria:
Solar(AUT) = 1,00 * (0,68 * shortwave radiation / 1000)

Belgium:
Solar(BEL) = 1,00 * (0,70 * shortwave radiation / 1000)

Denmark:
Solar(DNK) = 1,00 * (0,72 * shortwave radiation / 1000)

France:
Solar(FRA) = 1,00 * (0,84 * shortwave radiation / 1000)

Germany:
Solar(GER) = 1,00 * (0,63 * shortwave radiation / 1000)

Italy:
Solar(ITA) = 1,00 * (0,67 * shortwave radiation / 1000)

Netherlands:
Solar(NLD) = 1,00 * (0,84 * shortwave radiation / 1000)

Poland:
Solar(POL) = 1,00 * (0,73 * shortwave radiation / 1000)

Portugal:
Solar(POR) = 1,00 * (0,8 * shortwave radiation / 1000)

Spain:
Solar(ESP) = 1,00 * (1,02 * shortwave radiation / 1000)

Sweden:
Solar(SWE) = 1,00 * (0,5 * shortwave radiation / 1000)

United Kingdom:
Solar(GBR) = 1,00 * (0,77 * shortwave radiation / 1000)

Wind onshore

Austria:
Wind(AUT) = 1,00 * ((0,93 + 0,05) / (1,0 + exp(3,0 – 0,61 * (wind – 2,6) – 0,0074)) – 0,05)

Belgium:
Wind(BEL) = 1,14 * ((0,76 + 0,05) / (1,0 + exp(3,1 – 0,50 * (wind – 2,6) – 0,0074)) – 0,05)

Denmark:
Wind(DNK) = 1,00 * ((0,87 + 0,06) / (1,0 + exp(3,2 – 0,52 * (wind – 3,0) – 0,0074)) – 0,06)

Finland:
Wind(FIN) = 1,00 * ((0,88 + 0,05) / (1,0 + exp(3,0 – 0,53 * (wind – 2,0) – 0,0007)) – 0,05)

France:
Wind(FRA) = 1,04 * ((0,9 + 0,05) / (1,0 + exp(3,0 – 0,52 * (wind – 2,5) – 0,0074)) – 0,05)

Germany:
Wind(GER) = 1,00 * ((0,92 + 0,05) / (1,0 + exp(3,2 – 0,529 * (wind – 2,5) – 0,0074)) – 0,05)

Italy:
Wind(ITA) = 1,05 * ((0,85 + 0,00) / (1,0 + exp(2,9 – 0,64 * (wind – 2,5) – 0,0074)) - 0,00)

Netherlands:
Wind(NLD) = 1,00 * ((0,91 + 0,04) / (1,0 + exp(3,3 – 0,53 * (wind – 2,5) – 0,0074)) – 0,04)

Norway:
Wind(NOR) = 1,00 * ((0,94 + 0,00) / (1,0 + exp(2,6 – 0,57 * (wind – 2,5) – 0,0007)) – 0,00)

Poland:
Wind(POL) = 1,00 * ((0,92 + 0,05) / (1,0 + exp(3,4 – 0,60 * (wind – 2,2) – 0,0074)) – 0,05)

Portugal:
Wind(POR) = 1,00 * ((0,92 + 0,00) / (1,0 + exp(2,8 – 0,66 * (wind – 2,0) – 0,0007)) – 0,00)

Spain:
Wind(ESP) = 1,00 * ((0,86 + 0,04) / (1,0 + exp(3,1 – 0,58 * (wind – 2,3) – 0,0074)) – 0,04)

Sweden:
Wind(SWE) = 1,00 * ((0,77 + 0,05) / (1,0 + exp(3,2 – 0,62 * (wind – 1,9) – 0,0007)) – 0,05)

United Kingdom:
Wind(GBR) = 1,00 * ((0,68 + 0,06) / (1,0 + exp(3,3 – 0,53 * (wind – 2,1) – 0,0074)) – 0,06)

Wind offshore

Belgium:
Wind(BEL) = 1,00 * ((0,97 + 0,06) / (1,0 + exp(3,2 – 0,4 * (wind – 2,7) – 0,001)) – 0,06)

Denmark:
Wind(DNK) = 1,00 * ((0,92 + 0,06) / (1,0 + exp(3,1 – 0,49 * (wind – 3,0) – 0,001)) – 0,06)

France:
Wind(FRA) = 1,00 * ((0,95 + 0,06) / (1,0 + exp(3,1 – 0,54 * (wind – 3,2) – 0,001)) – 0,06)

Germany:
Wind(GER) = 1,00 * ((0,86 + 0,06) / (1,0 + exp(3,2 – 0,48 * (wind – 3,0) – 0,001)) – 0,06)

Netherlands:
Wind(NLD) = 1,00 * ((0,81 + 0,06) / (1,0 + exp(3,5 – 0,54 * (wind – 3,0) – 0,001)) – 0,06)

United Kingdom:
Wind(GBR) = 1,00 * ((0,82 + 0,06) / (1,0 + exp(3,0 – 0,48 * (wind – 2,6) – 0,001)) – 0,06)

Wind Total (Ratio Onshore vs. Offshore):

The combined wind index is calculated as the capacity-weighted average of the published hourly onshore and offshore index values, each already rounded to two decimal places. The resulting combined hourly value is rounded to two decimal places using commercial rounding (round half away from zero). The applicable onshore and offshore weights are listed below and remain unchanged within each index version.

Belgium: 58,9% onshore, 41,1% offshore

Denmark: 63,1% onshore, 36,9% offshore

France: 93,6% onshore, 6,4% offshore

Germany: 87,6% onshore, 12,4% offshore

Netherlands: 54,6% onshore, 45,4% offshore

United Kingdom: 53,2% onshore, 46,8% offshore

Nordic (weight per country):

Wind: 18,9% Denmark (on+off), 23,2% Finland, 13,4% Norway, 44,5% Sweden

Temperature: 21,4% Denmark, 20,2% Finland, 19,7% Norway, 38,7% Sweden

Appendix 3: Countrywide means and their actual weightings (v26)

Austria

Province	Latitude	Longitude	temperature	wind	solar
Burgenland	48,00	16,50	3,3	38,3	12,2
Kärnten	46,75	13,75	6,2	0,7	6,2
Niederösterreich	48,50	16,25	18,8	52,4	23,6
Oberösterreich	48,25	14,00	16,7	1,2	20,9
Salzburg	47,25	13,00	6,2	0,0	5,6
Steiermark	47,25	15,25	13,8	7,2	18,3
Tirol	47,25	11,50	8,5	0,0	6,4
Vorarlberg	47,25	10,00	4,5	0,0	3,2
Wien	48,25	16,25	22,0	0,2	3,6

Belgium

Province	Latitude	Longitude	temperature	wind	solar
Antwerp	51,25	4,50	16,3	14,1	16,7
Brussels	50,75	4,25	10,7	0,0	2,8
East Flanders	51,00	3,75	13,3	18,2	16,7
Flemish Brabant	51,00	4,50	10,1	1,9	9,6
Hainaut	50,50	4,00	11,7	17,6	8,8
Limburg	50,75	5,50	7,6	11,6	12,9
Liège	50,50	5,50	9,6	11,0	6,9
Luxembourg	50,00	5,75	2,5	3,2	3,0
Namur	50,50	5,00	4,3	9,9	3,9
Walloon Brabant	50,75	4,75	3,5	3,5	3,0
West Flanders	51,00	3,00	10,4	9,0	15,7

Denmark

Province	Latitude	Longitude	temperature	wind	solar
Nordjylland	57,25	9,75	9,9	23,9	12,8
Midtjylland	56,25	9,25	22,9	37,6	25,6
Syddanmark	55,50	9,00	20,7	22,1	25,6
Sjaelland	55,50	11,75	14,3	15,1	24,0
Hovedstaden	56,00	12,25	32,2	1,3	12,0

Finland

Province	Latitude	Longitude	temperature	wind
Åland	60,25	20,00	0,5	0,7
Central Finland	62,50	25,50	5,0	4,4
Central Ostrobothnia	63,50	24,25	0,1	6,2
Kainuu	64,50	28,50	1,3	2,6
Kanta-Häme	61,00	24,50	3,1	0,5
Kymenlaakso	60,75	27,00	2,9	0,2
Lapland	67,50	27,00	3,2	8,5
North Karelia	63,00	30,00	3,0	0,0
North Ostrobothnia	65,00	26,00	7,6	37,7
North Savo	63,00	27,50	4,5	0,4
Ostrobothnia	63,00	21,50	3,2	17,7
Päijät-Häme	61,25	25,75	3,7	0,0
Pirkanmaa	61,75	23,75	9,6	0,6
Satakunta	61,50	22,00	3,9	4,2
South Karelia	61,00	28,00	2,3	0,2
South Ostrobothnia	62,75	23,00	3,5	13,6
South Savo	61,75	27,50	2,4	1,6
Southwest Finland	60,50	22,50	8,8	0,8
Uusimaa	60,25	24,75	31,4	0,1

France

Province	Latitude	Longitude	temperature	wind	solar
Auvergne-Rhône-Alps	45,50	4,50	12,6	3,0	12,2
Burgundy-Free-County	47,00	4,50	2,5	5,0	5,0
Brittany	48,00	-3,00	5,3	6,2	3,3
Central - Vale of the Loire	47,50	1,75	4,0	7,8	5,4
Corsica	42,00	9,00	0,5	0,1	1,0
Greater East	48,75	5,75	8,7	22,3	7,8
Heights-of-France	50,00	2,75	9,4	27,4	3,2
Isle-of-France	48,50	2,50	19,1	0,5	1,7
Normandy	49,00	0,25	5,2	4,7	1,8
New Aquitaine	44,75	-0,50	9,4	9,0	23,1
Occitania	43,75	1,00	9,3	7,5	18,2
Lands of the Loire	47,50	-0,75	6,0	6,1	6,7
Provence - Alps - Azure Coast	44,00	6,00	8,0	0,4	10,6

Germany

Province	Latitude	Longitude	temperature	wind	solar
Baden-Württemberg	48,50	9,00	13,4	3,0	12,6
Bavaria	49,00	11,50	15,9	4,2	26,7
Brandenburg & Berlin	52,50	13,50	7,5	14,1	8,2
Hesse	50,50	9,00	7,6	4,1	4,7
Lower Saxony & Bremen	52,50	9,00	10,5	20,7	9,1
Mecklenburg-Vorpommern	53,75	12,50	1,9	5,9	4,2
North Rhine-Westphalia	51,50	7,50	21,5	12,8	12,2
Rhineland-Palatine & Saarland	50,00	7,25	6,1	7,3	6,0
Saxony	51,00	13,50	4,8	2,1	4,8
Saxona-Anhalt	52,00	11,75	2,6	8,6	4,7
Schleswig-Holstein & Hamburg	54,25	9,75	5,7	14,3	4,0
Thuringia	51,00	11,00	2,5	2,9	2,8

Italy

Province	Latitude	Longitude	temperature	wind	solar
Abruzzo	42,25	13,50	2,2	2,5	3,2
Basilicata	40,50	15,75	0,9	9,7	1,7
Calabria	39,00	16,50	3,1	10,9	2,4
Campania	40,75	14,75	9,6	13,3	4,1
Emilia Romagna	44,50	11,25	7,6	0,3	10,0
Friuli	46,00	13,25	2,0	0,0	2,9
Lazio	42,00	12,50	9,8	0,9	6,7
Liguria	44,50	9,00	2,6	0,9	0,6
Lombardia	45,50	9,25	17,1	0,0	13,3
Marche	43,50	13,50	2,5	0,1	4,5
Molise	41,50	14,75	0,5	3,7	0,7
Piemonte	45,00	7,75	7,3	0,1	8,5
Puglia	41,00	16,25	6,7	20,3	10,9
Sardegna	40,00	9,00	2,7	10,0	4,5
Sicilia	37,50	14,00	8,2	25,8	7,2
Toscana	43,75	11,25	6,3	1,1	4,1
Trentino	46,00	11,00	0,9	0,0	2,3
Umbria	43,00	12,50	1,5	0,3	2,1
Valle d'Aosta	45,75	7,25	0,2	0,0	0,1
Veneto	45,50	11,75	8,3	0,1	10,2

Netherlands

Province	Latitude	Longitude	temperature	wind	solar
Drenthe	53,00	6,50	2,8	4,1	6,6
Flevoland	52,50	5,50	2,5	26,9	4,6
Friesland	53,25	5,75	3,7	3,9	5,1
Gelderland	52,00	6,00	12,0	3,9	13,5
Groningen	53,25	6,75	3,3	16,4	6,7
Limburg	51,25	6,00	6,3	2,1	7,7
North Brabant	51,50	5,25	14,7	6,9	16,9
North Holland	52,75	5,00	16,6	11,5	9,3
Overijssel	52,50	6,50	6,6	1,8	8,1
South Holland	52,00	4,50	21,5	12,4	12,0
Utrecht	52,00	5,25	7,8	0,5	5,5
Zeeland	51,50	3,75	2,2	9,6	4,0

Norway

Province	Latitude	Longitude	temperature	wind
Agder	58,50	7,75	5,6	5,5
Akershus	60,25	11,25	11,8	0,0
Buskerud	60,25	9,25	5,3	0,0
Finnmark	70,00	25,00	1,4	5,4
Østfold	59,25	11,25	5,6	1,0
Innlandet	61,50	10,00	7,0	6,4
Møre og Romsdal	62,75	7,25	5,1	3,6
Nordland	67,00	15,00	4,5	11,1
Oslo	60,00	10,75	13,1	0,0
Rogaland	58,75	6,00	8,9	20,5
Telemark	59,50	8,50	3,3	0,7
Troms	69,00	18,50	3,1	5,4
Trøndelag	64,00	11,00	8,7	30,3
Vestfold	59,25	10,25	4,8	0,7
Vestland	60,50	5,50	11,8	9,4

Poland

Province	Latitude	Longitude	temperature	wind	solar
Dolnoslaskie	51,00	16,50	7,6	4,2	5,8
Kujawsko-pomorskie	53,00	18,50	5,4	6,3	6,4
Lodzkie	51,50	19,50	6,4	4,9	4,7
Lubelskie	51,25	23,00	5,5	1,0	6,6
Lubuskie	52,25	15,25	2,6	5,5	9,4
Malopolskie	49,75	20,25	8,9	0,0	2,0
Mazowieckie	52,25	21,00	14,1	6,0	5,7
Opolskie	50,75	18,00	2,6	3,4	2,4
Podkarpackie	50,00	22,25	5,5	1,7	2,9
Podlaskie	53,25	23,00	3,1	3,0	5,8
Pomorskie	54,25	18,00	6,1	18,5	8,1
Slaskie	50,25	19,00	11,8	2,4	2,3
Swietokrzysk	50,75	20,75	3,2	0,8	3,2
Warminsko-mazurskie	53,75	20,75	3,7	4,6	10,0
Wielkopolskie	52,25	17,25	9,1	13,5	16,4
Zachodniopomorskie	53,50	15,50	4,4	24,2	8,3

Portugal

Province	Latitude	Longitude	temperature	wind	solar
Alentejo	38,25	-8,00	7,2	2,0	10,2
Algarve	37,25	-8,25	4,7	4,2	19,5
Center	40,25	-7,50	22,6	38,9	10,2
Lissabon	38,75	-9,25	29,1	14,7	29,1
North	41,50	-8,50	36,4	40,2	31,0

Spain

Province	Latitude	Longitude	temperature	wind	solar
Andalusia	37,50	-4,50	19,4	11,8	24,8
Aragon	41,50	-0,75	3,0	16,5	8,8
Asturias	43,25	-6,00	2,3	2,3	0,0
Basque country	43,00	-2,50	5,0	0,5	0,2
Cantabria	43,25	-4,00	1,3	0,1	0,0
Castilla - La Mancha	39,50	-3,00	4,7	16,3	22,7
Castile and Léon	41,75	-4,75	5,4	22,6	9,0
Catalonia	41,75	1,50	17,8	4,6	1,2
Extremadura	39,25	-6,25	2,4	0,3	24,7
Galicia	42,75	-8,00	6,1	13,1	0,1
La Rioja	42,25	-2,50	0,7	1,5	0,3
Madrid	40,50	-3,75	15,3	0,0	0,2
Region of Murcia	38,00	-1,50	3,5	0,9	5,6
Navarre	42,75	-1,50	1,5	5,1	0,8
Valencian Community	39,50	-0,50	11,6	4,4	1,6

Sweden

Province	Latitude	Longitude	temperature	wind	solar
Blekinge	56,25	15,25	1,5	0,4	2,7
Dalarna	61,00	13,50	2,8	3,9	2,8
Gotland	57,50	18,50	0,6	1,1	0,7
Gävleborg	61,50	16,75	2,8	7,9	1,8
Halland	56,75	13,00	3,3	2,8	5,9
Jämtland	63,25	14,00	1,3	12,4	0,9
Jönköping	57,50	14,25	3,5	3,1	4,9
Kalmar	57,25	16,25	2,4	3,6	5,8
Kronoberg	56,75	14,75	1,9	3,0	2,6
Norrbotten	67,25	19,00	2,4	13,9	0,6
Skåne	56,00	13,50	13,4	3,0	15,9
Stockholm	59,25	18,25	23,0	0,3	12,1
Södermanland	59,00	16,75	2,9	0,4	4,7
Uppsala	60,25	17,75	3,8	0,1	4,1
Värmland	60,00	13,00	2,7	2,8	2,7
Västerbotten	65,25	16,50	2,6	9,2	1,0
Västernorrland	63,25	17,75	2,3	20,0	1,3
Västmansland	59,75	16,25	2,7	0,8	2,9
Västra Götaland	58,25	12,00	16,7	8,0	18,1
Örebro	59,25	15,00	2,9	1,6	3,1
Östergötland	58,50	15,75	4,5	1,7	5,4

United Kingdom

Province	Latitude	Longitude	temperature	wind	solar
East Midlands	53,00	-0,75	7,1	2,9	11,4
East of England	52,50	0,75	9,2	3,1	15,3
London	51,50	0,00	13,7	0,1	1,8
NorthEast	55,00	-2,00	4,0	3,1	1,8
NorthWest	54,00	-2,75	11,0	3,2	4,7
SouthEast	51,25	-1,00	13,5	0,8	15,6
SouthWest	50,75	-3,50	8,3	2,2	22,7
West Midlands	52,50	-2,25	8,8	0,1	7,4
Yorkshire	53,50	-1,25	8,2	4,6	4,7
N Ireland	54,75	-7,00	2,9	9,4	2,2
N Scotland*	58,50	-3,50	0,0	22,7	0,0
Scotland	56,00	-4,00	8,4	39,4	3,8
Wales	51,75	-3,50	4,9	8,4	8,6

Offshore Wind

Belgium

Region	Latitude	Longitude	weight
offshore N	51,75	2,75	35,7
offshore SE	51,50	3,00	64,3

Denmark

Region	Latitude	Longitude	offshore
W	55,50	7,75	35,6
SE	54,50	11,50	16,2
E	55,25	12,75	28,4
NE	56,00	11,00	19,8

France

Region	Latitude	Longitude	weight
offshore S	43,00	4,00	3,6
offshore SW	47,25	-2,75	31,9
offshore NW	48,75	-2,50	32,2
offshore NE	50,00	0,50	32,3

Germany

Region	Latitude	Longitude	offshore
Borkum1	54,00	6,50	29,0
Borkum2	54,50	6,00	23,2
North1	54,50	7,75	17,6
North2	55,00	7,00	9,8
BalticSea	55,00	13,75	20,4

Netherlands

Region	Latitude	Longitude	offshore
offshore N	54,00	6,00	11,1
offshore Ijssel	53,00	5,25	12,2
offshore W	52,50	4,00	48,9
offshore SW	51,75	3,00	27,8

United Kingdom

Region	Latitude	Longitude	offshore
offshore NE	57,00	-1,75	21,1
offshore E	53,75	1,25	37,3
offshore SE	51,75	1,75	19,0
offshore S	50,50	-0,25	3,5
offshore NW	54,00	-3,75	19,1